

What is claimed is:

1. A structured data receiving apparatus receiving a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data into structured data stored in a receiving side and having a tree structure, each piece of fragment configuration information including reference information having identification information identifying corresponding fragment data from said plurality of fragment data and position information on a connection position of the corresponding fragment data in the structured data, said structured data receiving apparatus comprising:

receiving means for receiving the fragment data and the fragment configuration information and outputting them;

fragment data storing means for storing the fragment data output from said receiving means;

structured data storing means for storing the structured data; and

structured data concatenating means for concatenating predetermined fragment data, read from said fragment data storing means, into the structured data read from said structured data storing means, based on the position information and the reference information included in the fragment configuration information output from said receiving means.

2. The structured data receiving apparatus according to claim 1,

wherein said position information is position information having information specifying a node in the structured data and information specifying a connection position of the corresponding fragment data in relation to

the specified node.

3. The structured data receiving apparatus according to claim 2,

5 wherein the information specifying the connection position of the corresponding fragment data in relation to the specified node is

10 either information specifying a position, which is at the same level as that of the specified node in relation to a node that is one level higher than that of the specified node and which immediately precedes the specified node, as the connection position of a highest node of the corresponding fragment data,

15 or information specifying a position, which is a position at one level lower than that of the specified node and which is the last node at the lower level, as the connection position of the highest node of the corresponding fragment data.

20 4. The structured data receiving apparatus according to claim 1,

 wherein the reference information has information on contents of the corresponding fragment data and

25 wherein said structured data concatenating means concatenates the fragment data into the structured data, said fragment data being determined to be concatenated based on the information on the contents.

5. The structured data receiving apparatus according to claim 1,

30 wherein the reference information includes information on a name of a highest node of the corresponding fragment data and

 wherein said structured data concatenating means processes the position information based on the information

on the name of the highest node.

6. The structured data receiving apparatus according to claim 1,

5 wherein the fragment configuration information has information on a method for processing the fragment data

 wherein, for a part of the fragment data, fragment update data is received instead of the fragment configuration information corresponding to the fragment data, said fragment
10 update data being created by adding the information on the fragment data processing method and the position information on a connection position in the structured data to the fragment data,

 wherein said receiving means receives the fragment data,
15 the fragment configuration information, and the fragment update data and outputs them and

 wherein, based on the information on the processing method included in the fragment update data output from said receiving means, said structured data concatenating means also
20 has a function that concatenates the fragment data, included in the fragment update data, into the structured data.

7. A structured data receiving apparatus receiving a plurality of fragment data and a plurality of fragment
25 configuration information, created one for each fragment data, to concatenate said plurality of fragment data into structured data stored in a receiving side and having a tree structure,

 each piece of fragment configuration information including reference information having location information
30 on a location of corresponding fragment data and position information on a connection position of the corresponding fragment data in the structured data, said structured data receiving apparatus comprising:

 fragment configuration information receiving means for

receiving the fragment configuration information and outputting it;

fragment data receiving means for identifying the location of the fragment data, based on the reference
5 information included in the fragment configuration information output from said fragment configuration information receiving means, and for receiving the fragment data from the identified location and outputting it;

structured data storing means for storing the structured
10 data; and

structured data concatenating means for concatenating the fragment data, acquired by said fragment data receiving means, into the structured data read from said structured data storing means, based on the position information included in
15 the fragment configuration information output from said fragment configuration information receiving means.

8. The structured data receiving apparatus according to claim 7,

20 wherein said position information is position information having information specifying a node in the structured data and information specifying a connection position of the corresponding fragment data in relation to the specified node.

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9. The structured data receiving apparatus according to claim 8,

wherein the information specifying the connection position of the corresponding fragment data in relation to
30 the specified node is

either information specifying a position, which is at the same level as that of the specified node in relation to a node that is one level higher than that of the specified node and which immediately precedes the specified node, as

the connection position of a highest node of the corresponding fragment data,

or information specifying a position, which is a position at one level lower than that of the specified node and which is the last node at the lower level, as the connection position of the highest node of the corresponding fragment data.

10. The structured data receiving apparatus according to claim 7,

wherein the reference information has information on contents of the corresponding fragment data and

wherein said structured data concatenating means concatenates the fragment data into the structured data, said fragment data being determined to be concatenated based on the information on the contents.

11. The structured data receiving apparatus according to claim 7,

wherein the reference information includes information on a name of a highest node of the corresponding fragment data and

wherein said structured data concatenating means processes the position information based on the information on the name of the highest node.

12. A structured data receiving method of receiving a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data having a tree structure,

each piece of fragment configuration information including reference information having identification information identifying corresponding fragment data from said plurality of fragment data and position information on a

connection position of the corresponding fragment data in the generated structured data,

5 said structured data receiving method comprising the step of concatenating the received fragment data to generate the structured data, based on the position information and the reference information included in the received fragment configuration information.

10 13. A structured data receiving method of receiving a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data stored having a tree structure,

15 each piece of fragment configuration information including reference information having location information on a location of corresponding fragment data and position information on a connection position of the corresponding fragment data in the generated structured data,

20 said structured data receiving method comprising the step of concatenating the received fragment data to generate the structured data, based on the position information and the reference information included in the received fragment configuration information.

25 14. A structured data receiving program causing a computer to function as a receiving apparatus receiving a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data into structured data stored in a receiving side and having a tree structure,

30 each piece of fragment configuration information including reference information having identification information identifying corresponding fragment data from said

plurality of fragment data and position information on a connection position of the corresponding fragment data in the structured data, said structured data receiving program comprising:

5 a receiving function for receiving the fragment data and the fragment configuration information and outputting them; and

 a structured data concatenating function for concatenating the received fragment data into the structured
10 data based on the position information and the reference information included in the received fragment configuration information.

15 15. A structured data receiving program causing a computer to function as a receiving apparatus receiving a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data into structured data stored in a receiving side and having a tree structure,
20 each piece of fragment configuration information including reference information having location information on a location of corresponding fragment data and position information on a connection position of the corresponding fragment data in the structured data, said structured data
25 receiving program comprising:

 a fragment configuration information receiving function for receiving the fragment configuration information and outputting it;

 a fragment data receiving function for identifying the
30 location of the fragment data, based on the reference information included in the received fragment configuration information and for receiving the fragment data from the identified location and outputting it; and

 a structured data concatenating function for

concatenating the received fragment data into the structured data, based on the position information included in the received fragment configuration information.

5 16. A structured data transmitting apparatus transmitting a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data having a tree
10 structure,

 each piece of fragment configuration information including reference information having identification information identifying corresponding fragment data from said plurality of fragment data and position information on a
15 connection position of the corresponding fragment data in the generated structured data, said structured data transmitting apparatus comprising:

 transmitting means for transmitting a data stream generated by arranging the fragment data and the fragment
20 configuration information one after another.

 17. The structured data transmitting apparatus according to claim 16,

 wherein said position information is position
25 information having information specifying a node in the structured data and information specifying a connection position of the corresponding fragment data in relation to the specified node.

30 18. The structured data transmitting apparatus according to claim 17,

 wherein the information specifying a connection position of the corresponding fragment data in relation to the specified node is

either information specifying a position, which is at the same level as that of the specified node in relation to a node that is one level higher than that of the specified node and which immediately precedes the specified node, as
5 the connection position of a highest node of the corresponding fragment data,

or information specifying a position, which is a position at one level lower than that of the specified node and which is the last node at the lower level, as the connection position
10 of the highest node of the corresponding fragment data.

19. The structured data transmitting apparatus according to claim 16,

wherein the reference information has information on
15 contents of the corresponding fragment data.

20. The structured data transmitting apparatus according to claim 16,

wherein the reference information includes information
20 on a name of a highest node of the corresponding fragment data.

21. The structured data transmitting apparatus according to claim 16,

wherein the fragment configuration information has
25 information on a method for processing the fragment data,

further comprising fragment update data generating means for generating, for a part of the fragment data, fragment update data instead of the fragment configuration information corresponding to the fragment data, said fragment update data
30 being created by adding the information on the fragment data processing method and the position information on a connection position in the structured data to the fragment data,

wherein said transmitting means transmits a data stream generated by arranging the fragment data, the fragment

configuration information, and the fragment update data, one after another.

22. A structured data transmitting apparatus
5 transmitting a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data having a tree structure,

10 each piece of fragment configuration information including reference information having location information on a location of corresponding fragment data and position information on a connection position of the corresponding fragment data in the structured data, said structured data
15 transmitting apparatus comprising:

transmitting means that, when any of the fragment data or all the fragment configuration information is requested by the receiving side, transmits the requested fragment data or the requested all the fragment configuration information
20 to the receiving side.

23. The structured data transmitting apparatus according to claim 22,

wherein said position information is position
25 information having information specifying a node in the structured data and information specifying a connection position of the corresponding fragment data in relation to the specified node.

30 24. The structured data transmitting apparatus according to claim 23,

wherein the information specifying a connection position of the corresponding fragment data in relation to the specified node is

either information specifying a position, which is at the same level as that of the specified node in relation to a node that is one level higher than that of the specified node and which immediately precedes the specified node, as
5 the connection position of a highest node of the corresponding fragment data,

or information specifying a position, which is a position at one level lower than that of the specified node and which is the last node at the lower level, as the connection position
10 of the highest node of the corresponding fragment data.

25. The structured data transmitting apparatus according to claim 22,

wherein the reference information has information on
15 contents of the corresponding fragment data.

26. The structured data transmitting apparatus according to claim 22,

wherein the reference information includes information
20 on a name of a highest node of the corresponding fragment data.

27. A structured data transmitting method of transmitting a plurality of fragment data and a plurality of fragment configuration information, created one for each
25 fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data having a tree structure,

each piece of fragment configuration information including reference information having identification
30 information identifying corresponding fragment data from said plurality of fragment data and position information on a connection position of the corresponding fragment data in the generated structured data,

said structured data transmitting method comprising the

step of transmitting a data stream generated by arranging the fragment data and the fragment configuration information, one after another.

5 28. A structured data transmitting method of transmitting a plurality of fragment data and a plurality of fragment configuration information, created one for each fragment data, to concatenate said plurality of fragment data in a receiving side to generate structured data having a tree
10 structure,

 each piece of fragment configuration information including reference information having location information on a location of corresponding fragment data and position information on a connection position of the corresponding
15 fragment data in the generated structured data,

 said structured data transmitting method comprising the step of, in response to a request for one of the fragment data or all the fragment configuration information from the receiving side, transmitting the requested fragment data or
20 the requested all the fragment configuration information to the receiving side.